Power Measurement

AD-LU 620 GVF

Description

The digital power measuring transducer AD-LU 620 GVF measures all quantities of the three-phase network (current, voltage, energy, harmonics, phase angle, active power, reactive power, apparent power) and converts these measuring values onto two freely scalable analogue outputs. With the integral relay and transistor output, the switching of limiting values or the output of energy pulses is possible. The unit is therefore optimal suitable for integration in energy management systems. For measuring of high voltages or high currents, external transformers can be connected in series at any time. All measuring ranges and outputs can be freely parameterized. This can be carried out via the optional operating modul AD-VarioControl or via the programming software AD-Studio. The LEDs at the front signals the operating condition and the relay-status. The compact type of construction and the high performance ability with simultaneous low energy consumption allows usage in almost any application.

Application

Typical usage in plant, machines or energy management systems for balancing and determination of energy distribution.



Specific characteristics

- Connection of 3 phases with neutral, any load
- Measuring quantities: effective power, reactive power, apparent power, currents and voltages, frequency, power factor, harmonics, energy metering
- current and voltage output
- relay or transistor output
- Counters for active power (consuption and infeed), reactive power (inductive and capacitive) and apparent power
- 33 mm narrow housing with detachable terminal clamp
- Operating module AD-VarioControl as an accessory

Business data

Order number

AD-LU 620 GVF

Accessory (optional)

Operating module	AD-VarioControl
USB programming adapter	AD-VarioPass
Configuration software	AD-Studio

Information

Downloads

Operation manual VarioControl	man-variocontrol-ad-en.pdf
Safety instructions	ad-safety-instructions.pdf

Technical specifications

Current-inputs (I1...I3)

Measuring ranges	0 ... 1 A AC; 0 ... 5 A AC
Max. measurable harmonic	40

Voltage-inputs (L1...L3)

Measuring range	10 ... 253 V AC
Input resistance	> 1 MOhm

Output current

Output range	0/4 ... 20 mA
Max. load	400 Ohm
Resolution	11 Bit
Residual ripple	25 µAss

Output voltage

Output range	0/2 ... 10 V
Min. load	10 kOhm
Resolution	11 Bit
Residual ripple	20 mVss

Semiconductor output

Maximum switching load DC	30 V, 50 mA
Pulse length min ... max	50 ms ... 10000 ms

Relay output

Maximum switching load AC	250 V, 2 A
Maximum switching load DC	50 V, 2 A
Contact construction	potential-free changeover
Switching operations mechanical	$1 * 10^7$
At 230V/2A AC, cos(phi)=1	$6 * 10^5$
At 230V/2A AC, cos(phi)=0,4	$2 * 10^5$
At 24V/2A DC	$2 * 10^5$
Pulse length min ... max	500 ms ... 10000 ms

Subject to technical changes and printing errors.

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Supply

Voltage range AC	50 ... 253 V AC, 50/60 Hz
Nominal voltage AC / DC	230 V AC / 24 V DC
Voltage range DC	20 ... 253 V DC
Power consumption AC / DC	4,6 VA / 2,4 W
Power consumption with operating module AC / DC	4,8 VA / 2,6 W

Transmission behaviour

Basic accuracy	< 0,5 % (class 0.5)
Temperature influence	80 ppm/K
Response time	< 0,5 s

Housing

Dimensions (WxHxD)	33x110x134mm
With operating module (bxhxt)	33x110x138 mm
Type of protection	IP 20
Connection method	detachable terminal clamp
Terminals, wire cross section	2,5 mm² flex wire / 4 mm² one wire
Bolting torque terminals	0,5 Nm
Skinning length	6 mm
Weight	~ 190 g
Manner of fastening	35 mm DIN rail 35mm

Environmental conditions

Ambient temperature	-10 ... 50 °C
Storage and transport	-10 ... 70 °C (no condensation)

EMC

Product family standard	EN 61326-1 [1]
Emitted interference	EN 55011, CISPR11 Cl. B, Gr. 1

[1] During checking, slight signal deviations are possible.

Electrical safety requirements

Product family standard	EN 61010-1
Overvoltage category	II
Pollution degree	2
Safety measurement	EN 61010-2-030
Measurement category	CAT III

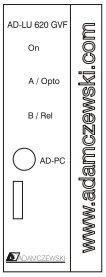
Galvanic isolation, test voltages

Input to outputs / power-supply	4 kV, 50 Hz (1 min.)
Power-supply to outputs	3 kV, 50 Hz (1 min.)
Relay contacts to outputs	3 kV, 50 Hz (1 min.)

Protection circuits

Input	electrical surge protection
Power supply	protection against over-temperature, over-voltage and over-current
Analog outputs	electrical surge protection

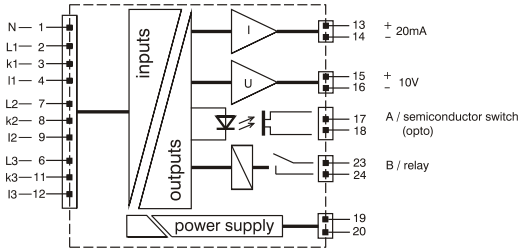
Display and operating elements



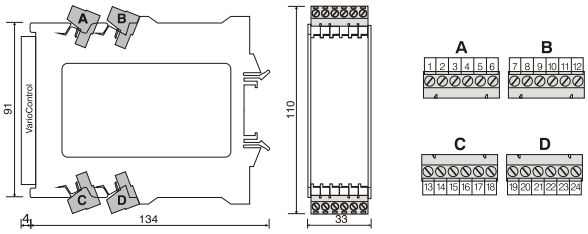
On: LED for operating display in green
on - normal operation
flashing - Signal failure, signal outside range limits
A / Opto: LED for semiconductor switch
on - activated
B / rel: LED for relays
on - activated
AD-PC: Communication interface for configuration by a PC

Communication interface for VarioControl

Block and wiring diagram



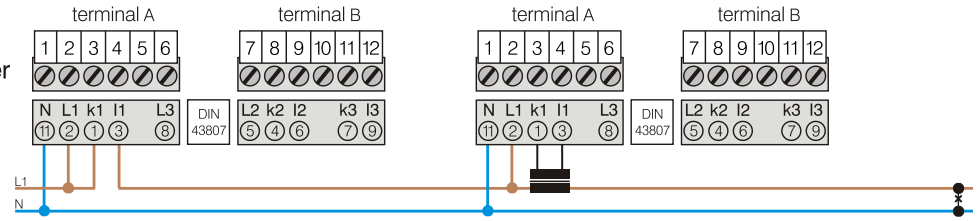
Dimensions



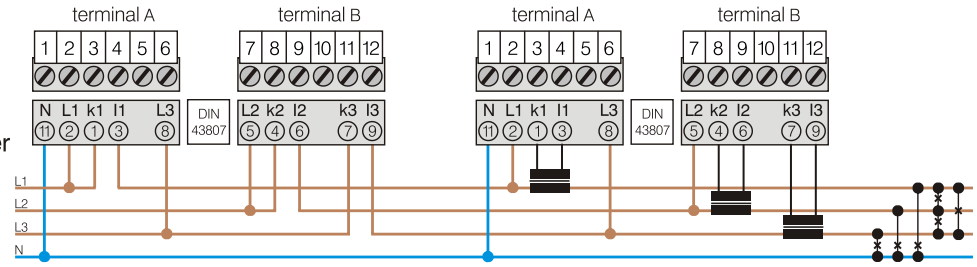
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Circuit examples

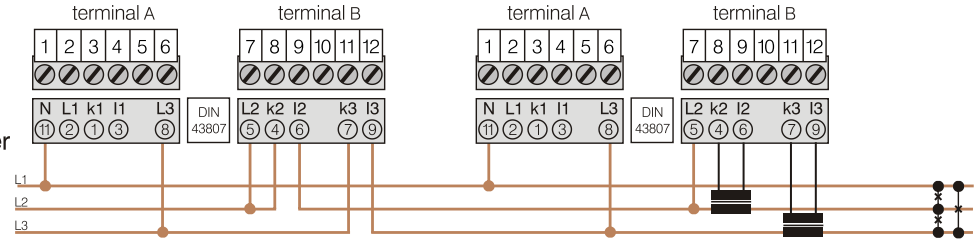
connection for
1 current transformer
(1 phase)



connection for
3 current transformer
in 4-wire system
(unsymmetric load)



connection for
2 current transformer
in 3-wire system
(unsymmetric load)
*Aron-circuit *1)*



*1) Attention: When using the Aron circuit, please observe the measured value list.
Only "bold"-written measured values can be used.

SALES & ADVICE
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Modbus Communication

The optional AD-VarioConnect operating module has an RS-485 interface. The data is transferred via the Modbus RTU protocol, the AD-VarioConnect operating module represents a Modbus slave. Communication takes place according to the master-slave procedure and starts with a request from the master, e.g. from a PLC or a PC. Each bus participant must have a unique address. If a slave detects that its address has been addressed by the master, the slave always sends an answer. The slaves never communicate with each other. They are also not able to start a communication with the master.
The Modbus master can read out the individual registers of the AD-LU 620 GVF via the addresses.
The default standard data format is 19200,e,8,1 with slave address 1. These settings can be changed via the AD-VarioConnect operating module.

Start address	Number of registers	Name	Unit	Data type	read	write
Measured values:						
40202	1	**digital output A**		3	1	1
40203	1	**digital output B**		3	1	1
40204	1	**digital output A LED**		3	1	1
40205	1	**digital output B LED**		3	1	1
40501	2	**active power total**	kW	7	1	0
40503	2	active power total L1	kW	7	1	0
40505	2	active power total L2	kW	7	1	0
40507	2	active power total L3	kW	7	1	0
40509	2	**total reactive power**	kvar	7	1	0
40511	2	reactive power L1	kvar	7	1	0
40513	2	reactive power L2	kvar	7	1	0
40515	2	reactive power L3	kvar	7	1	0
40517	2	total apparent power	kVA	7	1	0
40519	2	apparent power L1	kVA	7	1	0
40521	2	apparent power L2	kVA	7	1	0
40523	2	apparent power L3	kVA	7	1	0
40525	2	total power factor		7	1	0
40527	2	power factor in L1		7	1	0
40529	2	power factor in L2		7	1	0
40531	2	power factor in L3		7	1	0
40533	2	**total active fundamental power**	kW	7	1	0
40535	2	active fundamental power L1	kW	7	1	0
40537	2	active fundamental power L2	kW	7	1	0
40539	2	active fundamental power L3	kW	7	1	0
40541	2	**total active harmonic power**	kW	7	1	0
40543	2	active harmonic power L1	kW	7	1	0
40545	2	active harmonic power L2	kW	7	1	0
40547	2	active harmonic power L3	kW	7	1	0
40549	2	voltage L1	V	7	1	0
40551	2	**voltage L2**	V	7	1	0
40553	2	**voltage L3**	V	7	1	0
40555	2	current N line (calculated)	A	7	1	0
40557	2	current in L1	A	7	1	0
40559	2	**current in L2**	A	7	1	0
40561	2	**current in L3**	A	7	1	0
40563	2	voltage peak L1	V	7	1	0
40565	2	**voltage peak L2**	V	7	1	0
40567	2	**voltage peak L3**	V	7	1	0
40569	2	current peak L1	A	7	1	0
40571	2	**current peak L2**	A	7	1	0
40573	2	**current peak L3**	A	7	1	0
40575	2	**frequency**	Hz	7	1	0
40577	2	phase angle Phi L1	°	7	1	0
40579	2	phase angle Phi L2	°	7	1	0
40581	2	phase angle Phi L3	°	7	1	0
40583	2	**temperature**	°C	7	1	0
40585	2	phase angle Psi L1	°	7	1	0
40587	2	phase angle Psi L2	°	7	1	0
40589	2	phase angle Psi L3	°	7	1	0
40801	2	**output current**	mA	7	1	0
40803	2	**output voltage**	V	7	1	0
Counter:						
44003	2	counter consuption	kWh	5	1	1
44005	2	counter infeed	kWh	5	1	1
44007	2	counter inductiv	kVarh	5	1	1
44009	2	counter capacitiv	kVarh	5	1	1
44011	2	counter apparent energy	kVAh	5	1	1
44017	2	**counter load hours**	h	5	1	1

Legend of the datatypes:

U08: 1	**S08:** 2	**U16:** 3	**S16:** 4	**U32:** 5	**S32:** 6	**float:** 7